

CLAIMS:

1. A method for manufacturing an article having a thickened peripheral portion, comprising:

reverse squeezing an initial peripheral portion of an initial article to form a first intermediate article having a first intermediate peripheral portion that is partly thinned, and

squeezing the first intermediate peripheral portion of the first intermediate article to form a second intermediate article having a second intermediate peripheral portion that is thickened throughout.

2. A method as defined in claim 1, wherein the reverse squeezing step comprises:
vertically compressing the initial peripheral portion of the initial article to thereby form an inclined surface in the first intermediate peripheral portion.

3. A method as defined in claim 2, wherein the squeezing step comprises:
laterally compressing the first intermediate peripheral portion of the first intermediate article to thereby cause the inclined surface to transform into a vertical and horizontal surfaces as a result of plastic flow caused by plastic deformation.

4. A method as defined in claim 1 further comprises:
press forming a sheet material to thereby form the initial article.

5. A method as defined in claim 1 further comprises:
finishing the second peripheral portion of the second intermediate article.

6. A method as defined in claim 1 further comprises:
restriking the second intermediate peripheral portion of the second intermediate article.

7. A method as defined in claim 1, wherein the reverse squeezing step comprises:
seating the initial peripheral portion on a lower die of a reverse squeezing device,
and

extending a reverse squeezing member of the reverse squeezing device toward the lower die so as to compress the initial peripheral portion.

8. A method as defined in claim 1, wherein the squeezing step further comprises:
clamping the first intermediate peripheral portion of the first intermediate article between upper and lower restraint dies of a squeezing device, such that at least a portion of the first intermediate peripheral portion extends outwardly therefrom, and
pushing the upper and lower restraint dies into a squeezing member of the squeezing device together with the first intermediate article clamped therebetween so as to compress the first intermediate peripheral portion.
9. A method for manufacturing an article having a thickened peripheral portion, comprising:
seating an initial peripheral portion of an initial article on a lower die of a reverse squeezing device,
extending a reverse squeezing member of the reverse squeezing device toward the lower die so as to compress the initial peripheral portion, thereby forming a first intermediate article having a first intermediate peripheral portion that is partly thinned,
clamping the first intermediate peripheral portion of the first intermediate article between upper and lower restraint dies of a squeezing device, such that at least a portion of the first intermediate peripheral portion extends outwardly therefrom, and
pushing the upper and lower restraint dies into a squeezing member of the squeezing device together with the first intermediate article clamped therebetween so as to compress the first intermediate peripheral portion, thereby forming a second intermediate article having a second intermediate peripheral portion that is thickened throughout..
10. An apparatus for manufacturing an article having a thickened peripheral portion, comprising:
a reverse squeezing device for compressing an initial peripheral portion of an initial article to form a first intermediate article having a first intermediate peripheral portion that is partly thinned, and
a squeezing device for compressing the first intermediate peripheral portion of the first intermediate article to form a second intermediate article having a second intermediate peripheral portion that is thickened throughout, wherein the first intermediate peripheral portion is thickened as a result of plastic flow caused by plastic deformation.

11. An apparatus as defined in claim 10, wherein the reverse squeezing device comprises:

a lower die for seating the initial peripheral portion of the initial article thereon,
and
a reverse squeezing member for compressing the initial peripheral portion.

12. An apparatus as defined in claim 11, wherein the squeezing device comprises:

upper and lower restraint dies for clamping the first intermediate peripheral portion of the first intermediate article therebetween, such that at least a portion of the first intermediate peripheral portion extends outwardly therefrom, and

a squeezing member for compressing the first intermediate peripheral portion of the first intermediate article clamped between the upper and lower restraint dies.

13. An apparatus as defined in claim 11, wherein the reverse squeezing member is arranged and constructed to form an inclined surface in the first intermediate peripheral portion of the first intermediate article, so that a space is defined between the upper restraint die and the first intermediate peripheral portion when the first intermediate peripheral portion is clamped between the upper and lower restraint dies.

14. An apparatus as defined in claim 12, wherein a chamfered guide surface is defined in the squeezing member, the chamfered guide surface being arranged and constructed to inwardly squeeze the extending portion of the first intermediate peripheral portion.

15. An apparatus as defined in claim 10 further comprises:

a press forming device for producing the initial article from a sheet material.

16. An apparatus as defined in claim 10 further comprises:

a finishing device for finishing the second intermediate peripheral portion of the second intermediate article.

17. An apparatus as defined in claim 10 further comprises:

a restriking device for restriking the second intermediate peripheral portion of the

second intermediate article.